

# OBSERVATIONS ON SOME FUNGI FROM LOUISIANA AND MISSISSIPPI IN COMPARISON WITH THOSE OF MEXICO

GASTÓN GUZMÁN

*Instituto de Ecología, Apartado Postal 63, Xalapa, Veracruz 91000, México*

## ABSTRACT

Forty species of fungi (2 Ascomycotina, 37 Basidiomycotina, and 1 lichen) were collected during several field trips carried out in Louisiana and Mississippi. The discussion of these species emphasizes their distribution in Mexico, mainly in mesophytic forests, a type of vegetation with strong similarities to the eastern deciduous forests of the U.S.A. *Psilocybe pseudobullacea* is recorded from the U.S.A. for the first time, and *P. tampanensis* and *P. cubensis* are new records from Mississippi or Louisiana.

## INTRODUCTION

Many species of fungi found in the eastern U.S.A. also occur in the tropics, subtropics, and high mountains of Mexico (Sharp, 1948; Welden and Lemke, 1961; Guzmán, 1973). During a summer foray organized by the Gulf States Mycological Society (12-19 June 1995) in Mississippi, and some independent trips in Louisiana, several fungi were found that are common to both countries. These are discussed.

## FUNGI CONSIDERED

Table 1 shows the forty species discussed here, of which twenty were gathered by the author and deposited in the herbarium of the Institute of Ecology (XAL) at Xalapa, Veracruz, Mexico. These fungi were found in five localities (Table 2). Two of these are covered by forests, two are deposits of sugarcane bagasse, and the fifth consists of the gardens and streets of New Orleans.

## OBSERVATIONS ON THE SPECIES

One of the two ascomycetes (Table 1) was *Hypomyces lactifluorum*. It is a common parasite of russulaceous fungi and distorts the basidiocarp and gives it a reddish orange color. The parasite is common in *Quercus*, *Pinus-Quercus*, and mesophytic forests of Mexico, and also occurs in the deciduous forests of eastern North America. This host-parasite combination is edible and quite common in Mexico where it is sold in markets under the name of "enchilado" or "hongo enchilado" (i.e., hot mushroom), because of its somewhat spicy taste. *Xylaria magnoliae* grows only on the fallen fruits of *Magnolia*, a tree common both to the deciduous forests of eastern U.S.A. and the mesophytic forests of Mexico. San Martín-González and Rogers (1989) reported this species from Mexico on fruits of *M. schiedeana* Schl. *Xylaria magnoliae* is closely similar to *X. persicaria* (Schwein.:

TABLE 1. Species of fungi considered. The numbers indicate the localities (Table 2). An asterisk indicates specimens deposited at XAL Herbarium.

## ASCOMYCOTINA

*Hypomyces lactifluorum* (Schwein.: Fr.) Tul. (1)\**Xylaria magnoliae* J. D. Rogers (1)

## BASIDIOMYCOTINA

*Amanita hemibapha* (Berk. & Broome) Sacc. (1)*Amanita rubescens* (Pers.: Fr.) S. F. Gray (1)*Amanita vaginata* (Bull.: Fr.) Vittad. (1)*Boletus edulis* Bull.: Fr. (1)*Boletus pinophilus* Pilát & Dermek (1)*Calvatia cyathiformis* (Bosc) Morgan (1)*Calostoma cinnabarina* Desv. (1)\**Cantharellus confluens* (Berk. & M. A. Curtis) Petersen (1)\**Cantharellus lateritius* (Berk.) Singer (1)\**Chlorophyllum molydites* (Meyer: Fr.) Mass. (3,4,5)\**Conocybe lactea* (Lange) Métrod (1)\**Craterellus odoratus* (Schwein.) Fr. (1)*Cymatoderma caperatum* (Berk. & Mont.) Reid (2)*Ganoderma curtisii* (Berk.) Murrill (1)*Hydnopolyporus fimbriatus* (Fr.) Reid (1)*Lactarius hygrophoroides* Berk. & Curt. (1)*Lentinus boryanus* (Berk. & Mont.) Singer (1)\**Lepiota americana* (Peck) Peck (3,4)\**Microsporellus obovatus* (Juling.) Ryvarden (1)\**Panaeolus antillarum* (Fr.) Dennis (1)\**Perenniporia phloiophila* Gilb. & Blackwell (5)\**Pleurotus pulmonarius* (Fr.) Quéf. (2)\**Pluteus cervinus* (Schaeff.: Fr.) Kumm. (1,4)\**Psilocybe cubensis* (Earle) Singer (1)\**Psilocybe pseudobullacea* (Petch) Pegler (3)\**Psilocybe tampanensis* Guzmán & Pollock (1)*Pycnoporus sanguineus* (L.: Fr.) Murrill (1)*Russula brevipes* Peck (1)*Russula flavida* Frost & Peck (1)\**Russula virescens* (Schaeff. ex Zanted) Fr. (1)*Schizophyllum commune* Fr. (1)*Sparassis spathulata* (Schwein.: Fr.) Fr. (1)\**Stereum frustulatum* var. *subpileatum* (Berk. & M. A. Curtis) Welden (2)\**Stereum fasciatum* (Schwein.) Fr. (2)*Trichaptum bififormis* (Fr.) Ryvarden (1)\**Volvariella volvacea* (Bull.: Fr.) Singer (4)\**Xerula chrysopepla* (Berk. & M. A. Curtis) Singer (1)

## LICHENS

\**Chiodecton sanguineum* (Sw.) Vain.

Fr.) Berk. & M. A. Curtis, a fungus found exclusively on fallen fruits of *Liquidambar*; another common tree of the above-mentioned U.S.A. forests.

Among the basidiomycetes observed were species of *Cymatoderma*, *Sparassis*, and *Stereum* of the thelephoraceous fungi, *Cantharellus* and *Craterellus* among the

TABLE 2. Localities where fungi were observed.

---

1.	Old River Wild Life Management Area, Pearl River County, Mississippi. Subdeciduous forest with <i>Quercus</i> , <i>Carya</i> , <i>Magnolia</i> , <i>Pinus</i> , and meadows.
2.	Jean Lafitte National Historical Park, Barataria Unit, Jefferson Parish, Louisiana. Swampy forest with <i>Taxodium</i> , <i>Acer</i> , <i>Celtis</i> , <i>Quercus</i> .
3.	Donaldsonville region, Ascension Parish, Louisiana. Sugarcane bagasse.
4.	Near Brusly, West Baton Rouge Parish, Louisiana. Sugarcane bagasse.
5.	New Orleans, Orleans Parish, Louisiana. Streets and parks.

---

chanterelles, and *Ganoderma*, *Hydnopolyporus*, *Pycnoporus*, *Perenniporia*, and *Trichaptum* of the polyporaceous fungi.

*Cantharellus lateritius* and *C. confluens* are closely related. Corner (1966) considered *C. confluens* conspecific with *C. odoratus*, citing clamp connections on the hyphae of both. Petersen (1979a) wrote about *C. lateritius* and *C. confluens*: "The colors of pileus and stipe (in *C. confluens*) are brighter than those of *C. lateritius*, and with virtually no pinkish component. Microscopic characters vary little in the two taxa." At first (1979b) Petersen reported *C. lateritius* as *C. odoratus* and *C. confluens* as *C. lateritius*. In his color plate II, figures 5-8, he shows one fungus (the true *C. confluens*) with a more orange pileus and a white to yellow hymenium as compared with the other (the true *C. lateritius*), which is paler or more pinkish in both parts. *Cantharellus confluens* was described from Orizaba, Veracruz, Mexico (Berkeley, 1867) as *Craterellus confluens* Berkeley & M. A. Curtis. It was next reported by Guzmán and Sampieri (1984) as *C. odoratus* from the region of Huatusco, Veracruz. This fungus is very frequent in both regions and is the most important edible mushroom in the Huatusco market, where it is known as "hongo de encino" (i.e., oak mushroom). It is so popular and excellent in taste among edible species that it won first place among mushroom dishes prepared during a Mushroom Exposition at Xalapa in 1983 (Guzmán and Sampieri, 1984). This fungus is known today in Córdoba and Xalapa regions as "hongo de Huatusco" (i.e., Huatusco's mushroom), because every year it is present in the dishes at the mushroom fairs of Córdoba. Petersen (1979a) states that *Cantharellus lateritius* "is by far the most common cantharelloid fungus with suppressed hymenial folds in eastern North America." It is a tropical element in the eastern U.S.A. versus *C. confluens*, which appears to be a rare species. One of the collections of *C. odoratus* reported by Guzmán and Sampieri (1984) from the Cofre de Perote region (Veracruz State) in a color plate (Figure 4) is really *C. cibarius*; this is also an important edible mushroom quite frequent in *Pinus-Quercus* forests of Mexico. *Cantharellus cibarius* is exported to the U.S.A. and Europe.

*Cymatoderma caperatum* is a tropical element in the eastern U.S.A. and is quite common in southern Louisiana and Mississippi during warm, wet periods. *Sparassis spathulata* is unknown in Mexico, but *S. crispa* Wolf: Fr. and *S. radicata* Weir are more or less common in the *Pinus-Quercus* forests of the country. *Stereum frustulatum* var. *subpileatum* Welden and *S. fasciatum* (*S. ostrea* (Blume & Nees: Fr.) Fr.) are common in the same *Pinus-Quercus* and mesophytic forests of Mexico. Among the polypores, *Ganoderma curtisii*, *Hydnopolyporus fimbriatus*, *Microporellus obovatus*, and *Trichaptum bififormis* are of frequent occurrence in *Pinus-Quercus* and

mesophytic forests of Mexico. *Perenniporia phloiphila*, found on the bark of *Quercus virginiana* Mill. in New Orleans, is unknown in Mexico. *Pycnoporus sanguineus* is sometimes considered conspecific with *P. cinnabarina* (Jacq.: Fr.) Karst. (Cunningham, 1995; Castillo and Guzmán, 1970). I have examined several collections from the eastern U.S.A., mainly from Michigan, and compared them with several from Mexico, Colombia, and Brazil and could not find any difference between them in either macroscopic or microscopic features. This fungus, with *Schizophyllum commune*, is a very common species in the eastern U.S.A. but in Mexico they grow only in the tropical and subtropical (mesophytic) vegetation; they are absent from *Pinus-Quercus* forests except in some sites that border on the tropics. These two species, *Pycnoporus sanguineus* and *Schizophyllum commune*, may be used as ecological indicators from tropical sites with a strong human influence (Guzmán, 1994).

Among the agarics (Table 1), all are more or less common in pine-oak forests or mesophytic forests of Mexico, or both, except *Chlorophyllum molybdites*, which is typical of meadows and gardens of tropical regions. *Lepiota americana*, frequent in the sugarcane bagasse of sites 3 and 4, seems rare in Mexico (Guzmán and Guzmán-Davalos, 1992). *Panaeolus antillarum*, also known as *P. solidipes* (Peck) Sacc., *P. campanulatus* (L.: Fr.) Quél., or *P. phalaenarum* (Fr.) Quél. sensu Kühner & Romagnesi, is not an uncommon meadow mushroom on cow or horse dung in all the world's tropical and subtropical regions, including the eastern U.S.A. *Volvariella volvacea* occurs in all tropical regions of the world but is rare in the eastern U.S.A. and in the mesophytic forests of Mexico. *Xerula chrysopepla* is a widespread mushroom growing from the tropics to the cold coniferous forests, although rare in the latter and in deciduous and mesophytic forests.

The three species of *Psilocybe* represent new records for Mississippi and Louisiana. *Psilocybe tampanesis* was known previously only from the type locality: SE of Badon, near Tampa, Florida, and is based on one specimen (Guzmán and Pollock, 1978; Guzmán, 1983). The Mississippi material, also one specimen, was collected in a meadow of sandy soil, a habitat similar to that of the type collection. However, the Mississippi specimen has a conic-subumbonate pileus versus a convex and slightly umbilicate pileus in the type, a feature not considered significant enough to separate the Mississippi specimen into another species. More specimens are needed from the two localities to properly evaluate this feature. The spores and cheilocystidia, as well as the paucity of pleurocystidia, agree in both collections. Spores from the Mississippi material are  $9.5-10.5$  (-11)  $\times$   $6.5-7$  (-8)  $\times$   $6-6.5$  (-9)  $\mu\text{m}$ , and are subrhombic and thick-walled. The pleurocystidia are rare,  $12-16$  (-17.5)  $\times$  (5-)  $5.5-6.5$  (-9)  $\mu\text{m}$ , vesiculose-acuminate or lageniform, and cheilocystidia are (14.5-)  $16-25.5$  (-32)  $\times$   $4-6.5$  (-7)  $\mu\text{m}$  and lageniform. *Psilocybe pseudobullacea* was known only from eastern Africa, Sri Lanka, New Guinea, Ecuador, Venezuela, and Mexico (Guzmán, 1983), where it grows on dung or sugarcane bagasse. The Louisiana specimens, one collection with several basidiomes on sugarcane bagasse, agree well with my previous description (Guzmán, 1983). This is the first record for the U.S.A. The spores are (8.5-)  $9.5-11$   $\times$  (6-)  $6.5-7$   $\times$   $6-7$   $\mu\text{m}$ , the cheilocystidia (12-)  $13.5-25$   $\times$   $5.5-8$   $\mu\text{m}$ ; the pleurocystidia are absent. The fungus does not show a bluing reaction, and consequently it does not have hallucinogenic properties. Finally, *P. cubensis* is a subtropical fimicolous fungus widely distributed throughout the world, but has not been reported formally from the Mississippi region. The single specimen collected has spores (12-)  $13-16$  (-17.5)  $\mu\text{m}$  long, which agree well with those reported earlier (Guzmán,

1983). It is interesting to note that the hallucinogenic *P. caerulescens* Murrill, described from Montgomery, Alabama in 1923 has not been collected elsewhere in the U.S.A. It is a common species in Mexico and has been reported from Panama and Venezuela (Guzmán, 1983) and from Martinique in the Caribbean zone (Pegler, 1983b).

*Pleurotus pulmonarius*, also known as *P. ostreatus* var. *florida* Eger (Guzmán et al., 1994), seems to be of frequent occurrence in the eastern U.S.A. and in southern Europe, but unknown in Mexico. By means of a spore print from the Louisiana collection, this species is now being cultured at Xalapa in an attempt to obtain fructifications and for crossing with other strains, especially the Florida strain. *Lentinus boryanus*, also known as *L. dentosa* (Fr.) Murrill, is a common edible fungus in subtropical Latin America, where it grows on stumps. It is closely related to the Japanese shi'itake *L. edodes* (Berk.) Singer. Both species are treated by Pegler (1983a) as members of the genus *Lentinula* (Tribe Collybiae). *Amanita hemibapha* is recognized in eastern U.S.A. under the name *A. caesarea* var. *americana* (Scop.) J.-E. Gilbert, and is confused with *A. arkansana* Rosen. *Amanita hemibapha* is edible and is commonly sold in the markets of southeastern Mexico under the names "tecomate" and "yullo" because of a similarity in the reddish orange color of the pileus to a wild cucurbitaceous fruit called by those names.

*Calostoma cinnabarina* and *Calvatia cyanthiformis* are often found in the subtropics of Mexico, the former in mesophytic forests and the latter in the meadows and grasslands of those forests. *Calvatia* is a popular edible mushroom called "hongo bola" (i.e., ball mushroom). Spores from old basidiomes are used frequently to heal wounds. *Chiodecton sanguineum*, also known as *Cryptotheca rubrocinnata* (Ehrenb.) Thor, is, with its conspicuous reddish margin, the only lichen treated here. It occurs so regularly in Mexican mesophytic forests that it can be used as an ecological indicator for climax conditions of subtropical humid forests in Mexico (Guzmán, 1994).

#### ACKNOWLEDGMENTS

The author thanks his friends of the Gulf States Mycological Society, William Cibula, Toby Feibleman, Dorothea Munchow, Odin Toness, and A. L. Welden for their kind help during and after the foray in Mississippi and the field trips in Louisiana. He also thanks his assistant, Fidel Tapia, for help with microscopic observations.

#### LITERATURE CITED

- BERKELEY, M. A. 1867. On some new fungi from Mexico. Jour. Linn. Soc. Bot. 9: 422-425.  
 CASTILLO, J. AND G. GUZMÁN. 1970. Estudios sobre los poliporáceos de Nuevo Leon. II. Observaciones sobre las especies conocidas y discusiones acerca de su distribución en México. Bol. Soc. Mex. 31: 1-48.  
 CORNER, E. J. H. 1966. A monograph of the Cantharelloid fungi. Oxford University Press, London (255 pp. + 5 pls.).  
 CUNNINGHAM, G. H. 1965. Polyporaceae of New Zealand. Bull. New Zealand Depart. Sci. Indus. Res. 164: 1-304.  
 GUZMÁN, G. 1973. Some distributional relationships between Mexico and United States mycollorea. Mycologia 65: 1319-1330.  
 GUZMÁN, G. 1983. The genus *Psilocybe*. Beih. Nova Hedwigia. Cramer, Vaduz (439 pp. + 40 pls.).  
 GUZMÁN, G. 1994. Algunos aspectos importantes en la ecología de los hongos (en especial de los macromicetos). Ecológica. 3(2): 1-9.



- GUZMÁN, G. AND L. GUZMÁN-DAVALOS. 1992. A checklist of the lepiotaceous fungi. Koeltz Scientific Books, Champaign (216 pp.).
- GUZMÁN, G., L. MONTOYA, G. MATA, AND D. SALMONES. 1994. Studies in the genus *Pleurotus*. III. The varieties of *P. ostreatus* complex based on interbreeding strains and the study of basidiomata obtained in culture. *Mycotaxon* 50: 365-378.
- GUZMÁN, G. AND S. II. POLLOCK. 1978. A new bluing species of *Psilocybe* from Florida, U.S.A. *Mycotaxon* 7: 373-376.
- GUZMÁN, G. AND A. SAMPIERI. 1984. Nuevos datos sobre el hongo comestible *Cantharellus odoratus* en México. *Bol. Soc. Mex. Mic.* 19: 201-205.
- PEGLER, D. N. 1983a. The genus *Lentinus*. A world monograph. *Kew Bull. Add. Ser.* 10. H. M. S. O., London (281 pp.).
- PEGLER, D. N. 1983b. Agaric flora of the Lesser Antilles. *Kew Bull. Add. Ser.* 9. H. M. S. O., London (668 pp. + 27 pls.).
- PETERSEN, R. H. 1979a. Notes on cantharelloid fungi, X. *Cantharellus confluens* and *C. lateritius*, *Craterellus odoratus* and *C. aureus*. *Sydowia* 32: 198-208.
- PETERSEN, R. H. 1979b. Notes on cantharelloid fungi, IX. Illustrations of new or poorly understood taxa. *Nova Hedwigia* 31: 1-23.
- SAN MARTIN-GONZÁLEZ, F. AND J. D. ROGERS. 1989. A preliminary account of *Xylaria* of Mexico. *Mycotaxon* 34: 283-373.
- SHARP, A. J. 1948. Some fungi common to the highlands of Mexico and Guatemala and eastern United States. *Mycologia* 40: 499-502.
- WELDEN, A. L. AND P. A. LEMKE. 1961. Distribution of some Mexican fungi in North America. *Amer. Midl. Naturalist* 65: 111-117.